PROJECT NUMBER : 2108
PROJECT TITLE : New Product and Filter Technology
PROJECT LEADER : W. T. Callaham
PERIOD COVERED : December, 1990

I. PM PAPER AND FILTER DEVELOPMENT

A. **Objective:** To characterize web-type filter materials and develop subjectively acceptable products with them.

B. **Status:** Subjective results were received from the evaluation of Tela paper coated with 20% CA which indicated a positive response compared to uncoated Tela paper. James River Corporation was contacted and is investigating a technique for production of larger quantities of the CA coated material.

Sample cigarettes were hand-made with the latest James River produced PM papers. Models with Tela paper, James River 100% wood paper, 75% CA/25% softwood paper, and CA tow as mono filters were submitted for subjective evaluation. The 75/25 filter tested favorably to the CA tow control.

Sample hand-sheets with acetylated cellulose fiber (Batch 1,3,5 from Forest Products Lab) were received from Paper Technology personnel. The sheets were made into hand-made filters and cigarettes for subjective screening to determine the desired degree of acetylation.

Filtration efficiency data on the latest (November 8, 1990) James River web filters were received. This data showed similar efficiencies for like models produced on August 16, 1990 at James River. The efficiencies are comparable to paper per unit RTD. Neither Cellulon nor Buckeye cellulose yielded an increase in total efficiency per unit RTD versus TELA paper. Additional runs to produce larger quantities of PM web at James River are scheduled for January 3-4, 1991.

DAP and K_3PO_4 solutions, CEL and Burley solubles were coated onto Tela paper hand sheets by Paper Technology personnel. Three levels of addition were obtained: approximately 3, 6, and 9%. The sheets have been made into filter rods via the bench top corrugator. Hand made cigarettes will be prepared for subjective evaluation to determine possible improvements to the taste of paper filters.

II. MACHINERY DEVELOPMENT

A. **Objective:** Develop or modify manufacturing equipment to support Product Development efforts.

B. **Status:** The utilities and guarding for the Strip Application Unit (SAU) have been installed.

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The Strip Application Unit (SAU) has been used to produce bobbins of paper with standard cigarette base paper and bands of either capacitor paper (all cellulose - 35 g/m2) or Trim outer wrap (47 g/m2). Further evaluations of adhesives, adhesive patterns, and paper combinations are planned.

Tests have begun to use the bench top plug maker to produce 6mm diameter filter plugs. The intent is to develop the capability to replace the inner core of concentric filters produced at American Filtrona with various filtration materials of interest. Further modification of the bench top unit is necessary and parts are being redesigned.

III. NOVEL FILTERS AND FILTER MATERIALS

A. **Objective:** To investigate novel filters or filter materials for potential applications where increased efficiency, taste response or a novelty is needed.

B. Status: Sample filters were produced for evaluation in the BOLD 100's core. PM paper (75% CA/25% wood fiber) and Celanese CA web were evaluated and PM web will be further pursued as a core material.

Base concentric filter rods for the BOLD 100's combiner at Anderson Machine were produced at American Filtrona and utilized for machine set up.

Component rods for a BOLD KS Paper Core Concentric (PCC) recessed filter model were produced at American Filtrona. The filters will be combined at Stockton Street, and cigarettes will be produced.

IV. ALTERNATIVE PLASTICIZERS

A. **Objective:** Qualify alternative plasticizers which offer a product advantage.

B. Status: Flavor Development subjectively compared four triethyl citrate (TEC) plasticized Marlboro KS cigarette models against a triacetin (TA) plasticized control. The four TEC models consisted of two models plasticized with untreated TEC and two models plasticized with TEC treated with 10% PG with similar tar and nicotine deliveries. Flavor Development found the untreated TEC model most similar to the control. The Test and Control models were submitted to PED for more detailed subjective evaluations by an in-house walk-in panel.

V. CARBON STUDIES

A. **Objective:** Conduct fundamental studies of carbons and carbon filtered cigarettes to better understand their performance.

B. Status: An investigation is under way to determine the effect of tobacco volatiles upon carbon activity and subjective response. Lark Super Lights and PM Lights cigarette models with and without carbon were made in Semiworks and submitted to

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Flavor Development for analyses of the tobacco head space. The head space analyses will be done after 2 weeks, 1, 2, 3, 4, 5, and 6 months.

VI. MENTHOL TECHNOLOGY

A. **Objective:** To develop alternative mentholation techniques which offer a product advantage.

B. **Status:** After five weeks of desert room aging, mentholated dual CA/paper filters continue to show an improvement in stability over mentholated mono-CA filters. Additional models are planned which will have equivalent initial menthol-in-smoke values for subjective testing.

VII. PRODUCT DEVELOPMENT SUPPORT

A. **Objective:** To provide cigarette/filter design, modelling and testing support for major new product development programs.

B. **Status:** A meeting was held between R&D and Manufacturing Services personnel to discuss the status and plans for the continued development of the porous combining wrap for Lark. The most promising porous combining wrap to date is an Ecusta material with a modified hot melt adhesive (EVA coating on the felt side). Combining and tipping trials are in progress. Several Kimberly-Clark models will be evaluated in early January.

A meeting was held with Manufacturing Services and M/C Quality Audit personnel to enlist QA support for the evaluation of tipping and filter defects on Lark cigarettes produced with test combining wraps. Test cigarettes currently on-hand were submitted for evaluation. Data from the evaluations will be communicated to the material suppliers.

Preliminary experimentation has begun to identify CA/water emulsion systems that could be employed for application to paper web to improve its subjective quality. Dispersions of CA flake in water appear to be capable of attaining an increase of about 10% maximum uptake onto TELA web. Previous testing has shown that around 25% application rate is necessary to achieve the desired subjective response. Multi-component systems will be investigated to improve the amount of CA applied.

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